



Risco de sobrecarga de estresse em profissionais de saúde: revisão de escopo

Risk of stress overload in healthcare professionals: scoping review
Riesgo de sobrecarga de estrés en profesionales de la salud: revisión del alcance
Rafaella Torres de Carvalho<sup>1</sup>, Harlon França de Menezes<sup>2</sup>, Alessandra Conceição Leite Funchal
Camacho<sup>2</sup>, José Rebberty Rodrigo Holanda<sup>3</sup>, Richardson Augusto Rosendo da Silva<sup>3</sup>

#### **RESUMO**

Objetivo: mapear na literatura científica sobre o risco de sobrecarga de estresse em profissionais de saúde. Método: trata-se de uma revisão de escopo com base no modelo proposto pelo Joanna Briggs Institute, realizada de julho a agosto de 2023, em seis bases de dados nacionais e internacionais. Os dados para análise foram extraídos a partir de estressores intrapessoal, interpessoal e extrapessoal a partir do modelo teórico de Betty Neumam para uma planilha do Microsoft Excel 2016®. Resultados: a amostra do estudo foi composta por 115 estudos, publicados principalmente entre 2010 a 2022, oriundos da Europa, do tipo observacional, sendo os enfermeiros a principal categoria estudada. Foram classificados 21 estressores de risco intrapessoais, seis estressores interpessoais e dez estressores extrapessoais. Conclusão: os riscos de sobrecarga de estresse em profissionais de saúde mapeados foram a despersonalização (estressor intrapessoal), conflitos (interpessoais) e crises sanitárias (extrapessoais).

Descritores: Estresse ocupacional; Fatores de risco; Pessoal de saúde.

# **ABSTRACT**

**Objective:** to map the scientific literature on the risk of stress overload in healthcare professionals. **Method:** this is a scoping review based on the model proposed by the Joanna Briggs Institute, carried out from July to August 2023, in six national and international databases. Data for analysis were extracted from intrapersonal, interpersonal and extrapersonal stressors from Betty Neumam's theoretical model into a Microsoft Excel 2016® spreadsheet. **Results:** the study sample consisted of 115 studies, published mainly between 2010 and 2022, from Europe, of the observational type, with nurses being the main category studied. Twenty-one intrapersonal risk stressors, six interpersonal stressors and ten extrapersonal stressors were classified. **Conclusion:** the risks of stress overload in healthcare professionals mapped were

<sup>&</sup>lt;sup>1</sup> Universidade Federal Fluminense (UFF), Niterói-RJ.

<sup>&</sup>lt;sup>2</sup> Universidade Federal Fluminense (UFF), Niterói-RJ. \*E-mail: harlonmenezes@hotmail.com

<sup>&</sup>lt;sup>3</sup> Universidade Federal do Rio Grande do Norte (UFRN), Natal-RN.



# Journal of Education, Environment and Health ISSN 1983-0173

depersonalization (intrapersonal stressor), conflicts (interpersonal) and health crises (extrapersonal).

**Descriptors:** Occupational stress; Risk factors; Health personnel.

#### **RESUMEN**

**Objetivo:** mapear la literatura científica sobre el riesgo de sobrecarga de estrés en profesionales de la salud. **Método:** se trata de una revisión del alcance basada en el modelo propuesto por el Instituto Joanna Briggs, realizada de julio a agosto de 2023, en seis bases de datos nacionales e internacionales. Los datos para el análisis se extrajeron de los factores estresantes intrapersonales, interpersonales y extrapersonales del modelo teórico de Betty Neumam en una hoja de cálculo Microsoft Excel 2016®. **Resultados:** la muestra del estudio estuvo compuesta por 115 estudios, publicados principalmente entre 2010 y 2022, de Europa, del tipo observacional, siendo las enfermeras la principal categoría estudiada. Se clasificaron veintiún estresores de riesgo intrapersonal, seis estresores interpersonales y diez estresores extrapersonales. **Conclusión:** los riesgos de sobrecarga de estrés en los profesionales de salud mapeados fueron la despersonalización (estresor intrapersonal), los conflictos (interpersonales) y las crisis de salud (extrapersonales).

**Descriptores:** Estrés laboral; Factores de riesgo; Personal de salud.



#### INTRODUCTION

Occupational stress is the body's effort to adapt to the situations imposed on it, resulting from the relationship between psychological demand and work-related control. Work environments are often considered stressful places. In this way, it has repercussions on workers' health and can cause sick leave, physical and emotional exhaustion and accidents at work (CAVALCANTE et al., 2019).

This is influenced by the subject's perception of the demands of the work environment and their ability to cope with them. In other words, for the process of work-related stress to take place, the worker needs to perceive the situation and the demands of the environment as stressful, and perceive themselves as having few resources to cope with them, generating reactions with negative effects on their well-being(HIRSCHLE; GONDIM, 2020).

Beyond this individual level of analysis, the interest in studying these professionals is also justified by the nature of the services they provide, since the quality and effectiveness of their work can have a decisive impact on patients' health. In fact, and unlike many other professions, decision-making is particularly decisive in this occupation, since choosing the wrong treatment procedure and/or help can not only worsen the patient's condition but, in extreme cases, lead to their death (GOMES; CRUZ; CABANELAS, 2009).

Thus, the need for studies that address the impact of stress on workers' health and its repercussions on care activities has grown in recent decades, since in addition to workers' health, patient safety is also compromised (MUNHOZ et al., 2020).

In view of the importance of work and its repercussions in the current scenario, where there is a competitive search to keep up with constant technological developments and professional qualifications, there are still stress factors for workers that can have an impact on their quality of life. Therefore, investigating the effects of biopsychosocial factors on workers' health and well-being is important and valid. The workers' health approach understands that it is necessary to broaden the scope of public policies in order to transform the work processes that determine the health-disease relationship. This broadening brings challenges that drive the development of the formulation and implementation of policies for the surveillance and prevention of health problems. (HURTADO et al., 2022).

The aim of this scoping review is to map the aspects of the risk of stress overload in healthcare professionals in the scientific literature.



#### **METHODS**

This is a scoping review, carried out from July to August 2023, which followed the recommendations of the Joanna Briggs Institute, Reviewers Manual 2020, which establishes five stages: (1) identification of the research question; (2) identification of relevant studies; (3) selection of studies; (4) data analysis; and, (5) grouping, synthesis and presentation of data. (AROMATARIS; MUNN, 2020).

In order to group, synthesize and present the data with the utmost methodological rigor, it was developed based on the recommendations of the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist.(TRICCO et al., 2018). The protocol was registered with the Open Science Framework (OSF) under the link https://osf.io/3sa48/.

### Research question

The first stage was to formulate the research question, using the mnemonic strategy PCC (Population, Concept and Context), which is: What are the risk factors for stress overload in health professionals? The Population refers to health professionals; the Concept, Risk of Stress Overload; and the Context, Health Services.

# Types of fonts

In the second stage, before searching the databases, the descriptors representing the object of the study were identified using the Medical Subject Headings (MeSH) for terms in English and the Descritores em Ciências da Saúde (DeCS) for terms in Portuguese. The strategy was developed using synonyms/keywords and the Boolean operators AND and OR.

Thus, after selecting the descriptors, an open and broad search was carried out in the literature and on the OSF platform as a way of ensuring that reviews or protocols with the object of study in question or similar themes had not already been published. Once these had not been identified, the steps to consolidate the review were followed. After this, the selection of materials began in the Medical Literature Analysis and Retrieval System Online (MEDLINE) databases via PubMed, and The Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, Scopus, PSYCINFO and in the grey literature via the Portal of Periodicals of the Coordination for the Improvement of Higher Education Personnel (CAPES), based on identification in the Federated Academic Community (CAFe), as a way of standardizing collection in the databases listed.



# Search strategy

The strategies used are shown in Figure 1 below.

# Figure 01 - Search strategies. Niterói, RJ, Brazil, 2023

Figu	Figure 01 - Search strategies. Niterói, RJ, Brazil, 2023				
P U B M E D	(Risk Factors[mj] OR Risk Factor*[tiab] OR Signs and Symptoms[mj]) AND (Occupational Stress[mh] OR Occupational Stress*[tiab] OR Job Stress*[tiab] OR Work-related Stress*[tiab] OR Workplace Stress*[tiab] OR Professional Stress*[tiab] OR Job-related Stress*[tiab] OR Burnout[mj] OR Burnout[tiab]) AND (Health Personnel[mh] OR Health Personnel*[tiab] OR Health Care Provider*[tiab] OR Healthcare Provider*[tiab] OR Healthcare Worker*[tiab] OR Health Care Worker*[tiab] OR Health Professional*[tiab] OR Health Care Professional*[tiab] OR Nurses[mj] OR Nurse*[ti] OR Physicians[mj] OR Physician*[ti] OR Occupational Therapists[mj] OR Occupational Therapists[mj] OR Physical Therapist*[ti] OR Physiotherapist*[ti] OR Dentistry[mj] OR Dentistr*[ti] OR Health Services[ti]) NOT (Editorial*[ti] OR Letter*[ti] OR Abstract*[ti] OR Proceeding*[ti] OR Symposium[ti])				
S C O P U S	TITLE-ABS-KEY ("Risk Factor*" OR Risk* OR "Signs and Symptoms") AND TITLE ("Occupational Stress*" OR "Job Stress*" OR "Work-related Stress*" OR "Workplace Stress*" OR "Professional Stress*" OR "Job-related Stress*" OR Burnout) AND TITLE ("Health Personnel*" OR "Health Care Provider*" OR "Health Care Provider*" OR "Health Care Worker*" OR "Health Care Professional*" OR "Health Care Professional*" OR "Health Care Professional*" OR "Health Professional*" OR OR "Health Professional" OR "Occupational Therapist*" OR				
W O S	TS=("Risk Factor*" OR Risk* OR "Signs and Symptoms") AND TI=("Occupational Stress*" OR "Job Stress*" OR "Work-related Stress*" OR "Workplace Stress*" OR "Professional Stress*" OR "Job-related Stress*" OR Burnout) AND TI=("Health Personnel*" OR "Health Care Provider*" OR "Healthcare Provider*" OR "Healthcare Worker*" OR "Health Care Worker*" OR				
C I N A H L	("Risk Factor" OR Risk* OR "Signs and Symptoms") AND TI("Occupational Stress" OR "Job Stress" OR "Work-related Stress" OR "Workplace Stress" OR "Professional Stress" OR "Job-related Stress" OR Burnout) AND TI("Health Personnel" OR "Health Care Providers" OR "Healthcare Providers" OR "Healthcare Workers" OR "Health Care Workers" OR "Health Care Professionals" OR "Health Workers" OR "Health Professionals" OR Nurse* OR Physician* OR "Occupational Therapists" OR "Physical Therapists" OR Physiotherapist* OR Dentistry OR "Health Services")				





("Risk Factor" OR Risk\* OR "Signs and Symptoms" OR "Fator de Risco" OR "Fatores de Risco" OR "Sinais e Sintomas" OR "Factor de Riesgo" OR "Factores de Riesgo" OR "Signos y Síntomas") AND (ti:("Occupational Stress" OR "Job Stress" OR "Work-related Stress" OR "Workplace Stress" OR "Professional Stress" OR "Job-related Stress" OR Burnout OR "Estresse Ocupacional" OR "Estresse no Trabalho" OR "Estresse Relacionado ao Trabalho" OR "Estresse no Local de Trabalho" OR "Estresse Profissional" OR "Estrés Ocupacional" OR "Estrés Laboral" OR "Estrés Relacionado con el Trabajo")) AND ("Health Personnel" OR "Health Personnels" OR "Health Care Provider" OR "Health Care Providers" OR "Healthcare Provider" OR "Healthcare Providers" OR "Healthcare Worker" OR "Healthcare Workers" OR "Health Care Worker" OR "Health Care Workers" OR "Healthcare Professional" OR "Healthcare Professionals" OR "Health Care Professional" OR "Health Care Professionals" OR "Health Worker" OR "Health Workers" OR "Health Professional" OR "Health Professionals" OR Nurse\* OR Physician\* OR "Occupational Therapists" OR "Physical Therapists" OR Physiotherapist\* OR Dentistry OR "Health Services" OR "Pessoal de Saúde" OR "Profissional de Saúde" OR "Profissionais de Saúde" OR "Personal de Salud" OR "Profesional de Salud" OR Enfermeir\* OR Dentista\* OR Fisioterapeuta\* OR Médico\*) AND (db:("LILACS"))

Source: Prepared by the authors, 2023.

#### Selection of evidence

The selection of studies consisted of reading the titles and abstracts of the texts retrieved from the databases and repositories of theses and dissertations. In order to reach the third stage, the documents were screened according to the eligibility criteria by reading them in full to check their compatibility with the guiding question and thus extract the data. The analyses were carried out independently by pairs of reviewers on a scheduled day and time. In the event of disagreement between the two reviewers, the opinion of a third reviewer, the study supervisor, was requested.

Descriptive and analytical observational studies, individual case reports, expert consensus, guidelines, protocols, secondary studies, dissertations and theses were included. No language or time filters were applied. However, editorials, abstracts, correspondence, monographs, reviews and articles that are not fully available in the data sources were excluded.

#### Data extraction

For the fourth stage (separating, summarizing and reporting the essential data found), a structured authorial tool was used, designed specifically for this purpose. This tool allowed for the synthesis, interpretation of data and basic statistical analysis of the extent, nature and distribution of the selected studies that make up the final sample.



# Data analysis and presentation

As part of the fifth stage, the data collected was organized in Microsoft Excel 2016® software, in which information was presented on the continent of origin of the study, decade of publication, study design and professional category.

The data was analyzed descriptively in order to categorize the main findings and continuously correlate them with the proposed objective.

To categorize the findings, the classification according to the types of stressors according to Betty Neuman (ALMINO et al., 2021) was adopted.

Neuman's types of stressors were adopted because she believes that the individual is characterized as a system that is open to interactions with the environment in which it is inserted and which constantly seeks physical and mental stability. Thus, the data was classified according to intrapersonal stressors (related to the client's individual/internal issues), interpersonal stressors (related to the interaction that occurs between the client and the proximal environment) and extrapersonal stressors (external forces of environmental interaction that occur outside the client's boundaries) (ALMINO et al., 2021).

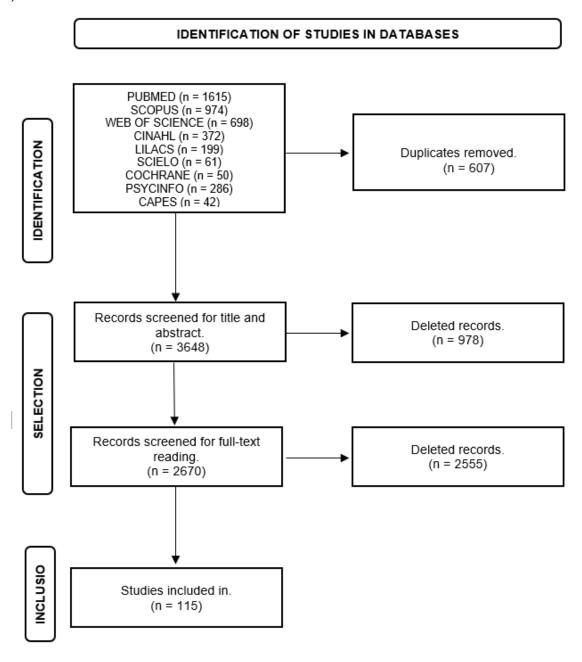
To illustrate this, a word cloud was created to visually represent the frequency and importance of the words in the context on screen. In other words, it is a tool used to highlight and analyze the frequency of the terms that appear in the data sources. It was created free of charge on the website: <a href="https://www.calculadora.app/texto/nuvem-de-palavras/">https://www.calculadora.app/texto/nuvem-de-palavras/</a>.

# **RESULTS**

After searching the scientific databases, 4255 records were identified and exported to the EndNote Web reference manager. 607 duplicates were removed, totaling 3648 records. Figure 2 shows the study selection process.



**Figure 2 -** PRISMA - ScR flow diagram showing the study selection process. Niterói, RJ, Brazil, 2023



Source: Prepared by the authors, 2023.



The characterization of the studies, according to the data extracted from the survey, is shown in Figure 3.

Figure 3 - General characterization of the included studies (n = 115). Niterói, RJ, Brazil, 2023

Category	Variable	n* (%)**
	Europe	47 (40,9)
	Asia	36 (31,3)
Origin of the studies	America	23 (20)
Origin of the studies	Africa	5 (4,3)
	Transcontinental	3 (2,6)
	Oceania	1 (0,9)
	2010 - 2022	105 (91,3)
Decade of publication	2000 - 2010	6 (5,2)
Decade of publication	1990 - 2000	2 (1,7)
	1980 - 1990	2 (1,7)
	Observational studies/ Cross-sectional studies/ Longitudinal studies	93 (80,9)
Charles de sino	Review studies	11 (9,6)
Study design	Not identified	7 (6,1)
	Qualitative studies	2 (1,7)
	Mixed studies	2 (1,7)
	Nurses	47 (40,9)
	Health professionals	29 (25,2)
	Doctors	25 (21,7)
	Doctors and nurses	4 (3,5)
	Paramedics	2 (1,7)
Profissional category	Physiotherapists	2 (1,7)
	Dentists	2 (1,7)
	Pharmacists	1 (0,9)
	Nurses and Paramedics	1 (0,9)
	Occupational therapists	1 (0,9)
	Radiology Technicians	1 (0,9)

<sup>\*</sup>n = Number of articles; \*\*Percentage of articles

Source: Prepared by the authors, 2023.

Figure 4 shows the distribution of the selected articles according to the types of stressors. Twenty-one intrapersonal risk stressors, six interpersonal stressors and ten extrapersonal stressors were classified.



**Figure 4** - Distribution of selected articles according to the type of stressors for the risk of stress overload in healthcare professionals.

overload in healthcare professionals.						
Type of Stressor	Risk of stress overload	Studies				
	Alcohol and substance use	McAuliffe et al (1984); Pedersen et al (2016); Medisauskaite; Kamau (2019); Pei et al (2021);				
	Anxiety/depressive symptoms	Gong et al (2014); Ádam et al (2015); Johnson (2015); Maharaj; Lees; Lal (2018); Chen et al (2020); Li; West; Xie (2020); Bai et al (2021); Fteropoulli et al (2021); Ghio et al (2021); Arimon-Pagès et al (2022);				
	Low personal fulfillment	Ramírez-Elvira et al (2021);				
	Breast cancer	Schernhammer et al (2004);				
	Excessive commitment	Bardhan et al (2019);				
	Hopelessness	Pompili et al (2006);				
	Cardiovascular disorder	Hegg-Deloye et al (2015); Lecca et al (2018), Ulguim et al (2019), Al Tunaiji et al (2020); Saberina et al (2020); Lin et al (2021); Alameri et al (2022);				
	Musculoskeletal disorder/pain	Smith et al (2006); Ryu et al (2014); Sakzewski; Naser-ud-Din (2015); Shieh et al (2016); Moradi; Barakat (2021);				
	Skin disorder	Liao et al (2019);				
	Urinary disorder	Zhang et al (2012);				
	Secondary traumatic stress	Hensel et al (2015), Wild et al (2016); Laurent et al (2022);				
Intrapersonal stressors	Fatigue	Frank et al (2007); Lee et al (2014); Denigris et al (2016); Higuchi et al (2016); Steege et al (2017); Wu et al (2017); Sabery et al (2019); Wijdenes et al (2019); Pérez-Chacón et al (2021); Lee; Kim (2022);				
	Lack of emotional intelligence/Alexithymia/Emo tional involvement	Visintini et al (1996); Soto-Rubio et al (2020); Pei et al (2021);				
	Strength	Heyns et al (2003)				
	Age	Gómez-Urquiza et al (2016)				
	Dissatisfaction at work	Kamau et al (2014); Jackson et al (2017); Al-Haddad et al (2020);				
	Insomnia/recovery sleep	Liao et al (2019); Lin et al (2019); Medisauskaite; Kamau (2019); Çaltekin; Hamamcı (2021); Liou et al (2021);				
	Personality/depersonalization	Beierhol et al (1991); Hisashige (1991); Volpe et al (2014); Salem et al (2018); Siau et al (2018); Silva et al (2019); Rogan et al (2019); Escudero-Escudero et al (2020); Gómez-Urquiza et al (2020); Meng et al (2021); Iyer et al (2022);				
	Sense of coherence	Scholz et al (2016)				
	Suicide	Pompili et al (2006); Ji et al (2020); Duarte et al (2023);				
	Length of experience	Molina-Praena et al (2018); Tang (2018); Zheng et al (2018);				
Interpersonal stressors	Support from superior/Lack of support	Ritcher et al (2014); Afonso et al (2021); Lozano et al (2021);				



# Journal of Education, Environment and Health ISSN 1983-0173

	Conflicts between the multi- team/Verbal aggression/Communication/Bu llying/Bad environment/Unfair treatment/Ethics/Tension/Pre ssure to achieve patient satisfaction	Sharma et al (2014); Viotti et al (2015); Gómez-Urquiza et al (2016); Kandelman et al (2017); Kakemam et al (2019); Pérez-Fuentes et al (2019); Purpora et al (2019); De Sio et al (2020); Feeks et al (2020); Dyrbye et al (2021); Lozano et al (2021); Vitale et al (2021);
	Clinical difficulties/High task demands	Belkic; Nedic (2007); Yao et al (2013); Sharma et al (2014); Teixeira et al (2014); Balducci et al (2020); Iyer et al (2022);
	Restricted problem-solving strategy	Belkic; Nedic (2007); Teixeira et al (2013);
	Fatherhood	Richter et al (2014);
	Proximity to death	Pélissier et al (2015);
	Supervisory/leadership responsibility	Belkić; Nedic (2007); Richter et al (2014); Grochowska et al (2022);
	Day or night shift	Beierhol et al (1989); d'Ettorre et al (2018); Kakemam et al (2019); Huang et al (2020);
	High workload	Hisashige (1991); Belkić; Nedic (2007); Śliwiński et al (2014); Sharma et al (2014); Freimann et al (2015); Liang et al (2020); Afonso et al (2021); Kwiatkowska-Ciotucha et al (2021);
	Temporary employment contracts	Teixeira et al (2013);
Extrapersonal	Poor financial situation/inadequate remuneration	Śliwiński et al (2014): Sharma et al (2014); Asante et al (2019);
stressors	Medical specialty	Rath et al (2015); Navarro et al (2017); Siau et al (2018); Boutou et al (2019); Abusanad et al (2021); Akyurt (2021); Crowe et al (2021);
	Care error	Van Gerven et al (2016);
	Health crises	Al Tunaiji et al (2020); El-Hage et al (2020); Giménez- Espert et al (2020); Jones et al (2020); Bruyneel et al (2021); Khan et al (2022); Laurent et al (2022); Li et al (2023);
	Infodemic	Bhargava et al (2020);
	Poor working conditions	Almeida et al (2020);
	Staff shortages	Afonso et al (2021);

Source: Prepared by the authors, 2023



**Figure 5 -** Word cloud of the risks of stress overload in health professionals. Niterói, RJ, Brazil, 2023



Source: Prepared by the authors, 2023.

# **DISCUSSION**

Of the studies that made up the sample, the majority (40.9%) originated in Europe, the place where scholars first tried to define stress from a biological perspective (FILGUEIRAS; HIPPERT, 1999). In second place is Asia, with 31.3% of the studies. This may be linked to the recent coronavirus pandemic (Sars-CoV-2) which has spread around the world, originating in China (PAIANO et al, 2020).

The fact of the pandemic is also linked to the spike in studies in recent years, as journals and public repositories have been concerned with disseminating the data found in an equitable and accessible way to as many researchers as possible, which has allowed information to be shared and exchanged (COSTA et al, 2020).

As for the design of the studies, the majority were observational epidemiological studies, since the intention was to observe and analyze the stress event and its factors, as well as the



behaviors that unfolded in natural environments of the phenomenon, without active intervention or deliberate manipulation of variables. The review studies were also relevant because, as the subject has been discussed for many years, they are considered to map the production of knowledge, bringing trends, challenges and advances.

A considerable proportion of the studies (40.9%) targeted nurses. Nursing is a profession in which professionals are constantly close to patients and their families, resulting in daily contact with possible suffering, anguish and death. In addition, of course, to exposure to chemical, physical and biological agents, which causes tension, anxiety and fear (SILVA; GOMES; CORGOZINHO, 2021).

Occupational stress in nursing is also related to high work demands, as it is associated with complex work demands and needs, and high expectations, excessive responsibility and toxic authority (BABAPOUR, GAHASSAB-MOZAFFARI, FATHNEZHAD-KAZEMI, 2022). These aspects result in reduced productivity and quality of work, increased rates of absenteeism and accidents at work and higher turnover of professionals, especially if we consider the Brazilian context (SILVA; GOMES; CORGOZINHO, 2021).

Betty Neuman's theoretical framework allowed for the identification of stressors and guided their characterization for the risk of stress overload in health professionals. Intrapersonal stressors stood out (21 risks), as it is believed that the person's internal factors, i.e. how they relate to their own emotions and feelings, can have repercussions on the body. The body aspect can be exemplified by cardiovascular, musculoskeletal, integumentary and urinary disorders.

Depersonalization was an intrapersonal stressor that stood out as a risk for stress overload. Depersonalization is when the individual has altered perceptions of themselves and their environment (MIGUEL-PUGA et al., 2021). It is also cited as the adoption of an attitude of insensitivity or hostility towards the people who should receive the service/care, and in some literature, defined as cynicism (VIEIRA, 2010).

In this sense, we can see that the risk of depersonalization is quite common among health professionals. These characteristics may be linked to the countless emotional tensions that unbalance the person and the lack of resources available to deal with these demands in the workplace. Anxiety was also one of the intrapersonal stressors highlighted by the studies. Anxiety is one of the most disabling disorders due to its direct influence on psychological effects and economic and social consequences.



The main interpersonal stressor found was conflict issues. An Indian study points out that, in the health sector, health professionals are subject to severe stress due to conflicts with other professional categories, conflicts with colleagues, conflicts with patients or their bystanders and supervisors, especially nurses (KAUSHIK et al., 2021). These conflicts unfold in verbal aggression, acts of prejudice, tension and pressure for optimum results, creating an unfavorable working environment that is conducive to stress overload.

The main extrapersonal stressor is the health crisis. As we have seen, the Covid-19 pandemic has revealed factors related to the moment. The first wave of the pandemic was marked by a high workload, difficult daily decisions, constantly changing protocols, limited personal protective equipment, caring for critically ill patients for fear of transmitting the infection to their families and a constant feeling of 'dealing with the unknown'. As a result, healthcare workers were constantly pushed to their limits and forced to make personal sacrifices, such as leaving their homes and families. In fact, exposure to patients infected with COVID-19 is associated with high levels of burnout, stress, depression and anxiety (DUARTE et al., 2022).

Thus, considering the objective of mapping the risks of stress overload in healthcare professionals, it was possible to understand that intrapersonal, interpersonal and extrapersonal stressors are different in their potential to influence the level of stability of the person's system or their normal line of defense.

It should be emphasized that the time of occurrence of the stressors, as well as the history and current situation of the client's system, the nature and intensity of the stressor and the amount of energy to adjust the system are important points to consider for care aimed at stimulating the person's coping with stress.

Finally, the most prominent word in Figure 5, "Work", is what drives human beings in their intellectuality. Work must be viewed responsibly, but also lightly, but it doesn't just depend on the worker/health professional, but on a system that supports good initiatives.

A limitation of this review is the high number of studies added, which makes it exhaustive to analyze. Other limitations refer to the low visibility of studies regarding gender and its repercussions for the risk of stress. With this in mind, there is the possibility of new studies that include aspects of interventions and their applicability in the lives of health professionals.



#### CONCLUSION

The study made it possible to map the risks of stress overload in health professionals through intrapersonal stressors (depersonalization), interpersonal stressors (conflicts) and extrapersonal stressors (health crises). It is hoped that the findings of this review will encourage managers and health services to provide resources that anticipate the decline in the mental health of health professionals by recognizing the risks/stressors.

#### **ACKNOWLEDGMENTS**

We would like to thank the Pro-Rectory for Research, Postgraduate Studies and Innovation (PROPPI) of the Fluminense Federal University (UFF) for the PIBIC-PDUFF call for support for UFF postdoctoral students - 2022.

### **REFERENCES**

- 1. Abusanad A, Bensalem A, Shash E, Mula-Hussain L, Benbrahim Z, Khatib S, et al. Burnout in oncology: Magnitude, risk factors and screening among professionals from Middle East and North Africa (BOMENA study). Psycho-Oncology. 2021 Feb 2;30(5):736-46.
- 2. Ádám S, Nistor A, Nistor K, Cserháti Z, Mészáros V. Facilitating the diagnosis of depression and burnout by identifying demographic and work-related risk and protective factors among nurses. Orv Hetil. 2015 Aug;156(32):1288-97.
- 3. Afonso AM, Cadwell JB, Staffa SJ, Zurakowski D, Vinson AE. Burnout Rate and Risk Factors among Anesthesiologists in the United States. Anesthesiology. 2021 Mar 5;134(5):683-96.
- 4. Akyurt N. Job satisfaction and perceived stress among radiology technicians: a questionnaire survey in relation to sociodemographic and occupational risk factors. Int Arch Occup Environ Health. 2021 Mar 16;94:1617-26.
- 5. Al Tunaiji H, Al Qubaisi M, Dalkilinc M, Campos LA, Ugwuoke NV, Alefishat E, et al. Impact of COVID-19 Pandemic Burnout on Cardiovascular Risk in Healthcare Professionals Study Protocol: A Multicenter Exploratory Longitudinal Study. Front Med. 2020 Dec 22;7.
- 6. Alameri F, Aldaheri N, Almesmari S, Basaloum M, Albeshr NA, Simsekler MCE, et al. Burnout and Cardiovascular Risk in Healthcare Professionals During the COVID-19 Pandemic. Front Psychiatry. 2022 Apr 4;13:867233.



- 7. Al-Haddad A, AL-Omar F, AL-Khaleel A, AL-Khalaf A. Prevalence of burnout syndrome and its related risk factors among physicians working in primary health care centers of the Ministry of Health, Al Ahsa region, Saudi Arabia, 2018-2019. J Family Med Prim Care. 2020;9(2):571.
- 8. Almeida ILGI, Duarte ACM, Simões ML, Azevedo DSS, Alcantara MA. Risk factors for common mental disorders in health care workers in the city of Diamantina, state of Minas Gerais. Rev Bras Med Trab. 2020;18(03):293-301.
- 9. Almino RH, Oliveira SS, Lima DM, Prado NC, Mercês BM, Silva RA. Occupational stress in the context of COVID-19: analysis based on Neuman's theory. Acta Paul Enferm. 2021;34:eAPE002655.
- 10. Arimon-Pagès E, Fernández-Ortega P, Fabrellas-Padrés N, Castro-García AM, Canela-Soler J. Dealing with Emotional Vulnerability and Anxiety in Nurses from High-Risk Units—A Multicenter Study. Int J Environ Res Public Health. 2022 May 4;19(9):5569.
- 11. Aromataris E, Munn Z (Editors). JBI Manual for Evidence Synthesis. JBI, 2020. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-01
- 12. Asante JO, Li MJ, Liao J, Huang YX, Hao, YT. The relationship between psychosocial risk factors, burnout and quality of life among primary healthcare workers in rural Guangdong province: a cross-sectional study. BMC Health Serv Res. 2019;19(1):1-10.
- 13. Babapour AR, Gahassab-Mozaffari N, Fathnezhad-Kazemi A. Nurses' job stress and its impact on quality of life and caring behaviors: a cross-sectional study. BMC Nurs. 2022 Mar 31;21(1):75.
- 14. Bai S, Chang Q, Yao D, Zhang Y, Wu B, Zhao Y. Anxiety in Residents in China: Prevalence and Risk Factors in a Multicenter Study. Acad Med. 2021 May;96(5):718-27.
- 15. Balducci C, Vignoli M, Dalla G, Consiglio C. High strain and low social support at work as risk factors for being the target of third-party workplace violence among healthcare sector workers. Med Lav. 2020;111(5):388-98.
- 16. Bardhan R, Heaton K, Davis M, Chen P, Dickinson DA, Lungu CT. A Cross Sectional Study Evaluating Psychosocial Job Stress and Health Risk in Emergency Department Nurses. Int J Environ Res Public Health. 2019 Sep 4;16(18):3243.
- 17. Beierhol M, Tiselius I, Ek AC. The Risk to Nurses of Developing Burnout Syndrome. Scand J Caring Sci. 1989 Mar;3(1):13-8.



- 18. Belkić K, Nedic O. Workplace Stressors and Lifestyle-Related Cancer Risk Factors among Female Physicians: Assessment Using the Occupational Stress Index. J Occup Health. 2007 Jan;49(1):61-71.
- 19. Bhargava S, Sarkar R, Kroumpouzos G. Mental Distress in Dermatologists During COVID -19 Pandemic: Assessment and Risk Factors in A Global, Cross-Sectional Study. Dermatol Ther. 2020 Aug 8;33(6):e14161.
- 20. Boutou A, Pitsiou G, Sourla E, Kioumis I. Burnout syndrome among emergency medicine physicians: an update on its prevalence and risk factors. Eur Rev Med Pharmacol Sci. 2019 Oct 1;23(20):9058-65.
- 21. Bruyneel A, Smith P, Tack J, Pirson M. Prevalence of burnout risk and factors associated with burnout risk among ICU nurses during the COVID-19 outbreak in French speaking Belgium.Intensive Crit Care Nurs. 2021 Apr;65:103059.
- 22. Çaltekin I, Hamamcı M. Is working in the emergency department a risk factor for sleep disorders for healthcare workers? Sleep Sci. 2021;14(2):129-35.
- 23. Cavalcante Jl, Pinto AGA, Brito Junior FE, Moreira MRC, Lopes MSV, Cavalcante EGR. Estresse ocupacional dos funcionários de uma universidade pública. Enferm. Foco 2019; 10 (4): 108-115.
- 24. Chen J, Liu X, Wang D, Jin Y, He M, Ma Y, et al. Risk factors for depression and anxiety in healthcare workers deployed during the COVID-19 outbreak in China. Soc Psychiatry Psychiatr Epidemiol. 2020 Sep 10;56:47-55.
- 25. Costa ICP, Sampaio RS, Souza FAC, Dias TKC, Costa BHS, Chaves ECL. Scientific production in online journals about the new coronavirus (covid-19): bibliometric research. Texto Contexto Enferm. 2020; 29:e20200235.
- 26. Crowe L, Young J, Turner MJ. What is the prevalence and risk factors of burnout among pediatric intensive care staff (PICU)? A review. Transl Pediatr. 2021 Oct;10(10):2825-35.
- 27. d'Ettorre G, Vullo A, Pellicani V, Ceccarelli G. Preliminary assessment of rotating shiftwork risk in a twenty-four hours hospital department. PubMed. 2018 Jun 13;30(4):297-306.
- 28. De Sio S, Buomprisco G, Perri R, Bruno G, Mucci N, Nieto HA, Battagliola E, Cedrone F. Work-related stress risk and preventive measures of mental disorders in the medical environment: an umbrella review. Eur Rev Med Pharmacol Sci. 2020;24(2).



- 29. Denigris J, Giarelli E, Fisher K, Maley M, Nolan E. Perceived Quality of Work Life and Risk for Compassion Fatigue Among Oncology Nurses: A Mixed-Methods Study. Oncol Nurs Forum. 2016 May 1;43(3):E121-31.
- 30. Duarte D, El-Hagrassy MM, Couto T, Gurgel W, Minuzzi L, Saperson K, et al. Challenges and potential solutions for physician suicide risk factors in the COVID-19 era: psychiatric comorbidities, judicialization of medicine, and burnout. Trends Psychiatry Psychother. 2023;45:e20210293.
- 31. Duarte I, Pinho R, Teixeira A, et al. Impact of COVID-19 pandemic on the mental health of healthcare workers during the first wave in Portugal: a cross-sectional and correlational study. BMJ Open. 2022 Dec 30;12(12):e064287.
- 32. Dyrbye LN, West CP, Herrin J, Dovidio J, Cunningham B, Yeazel M, et al. A Longitudinal Study Exploring Learning Environment Culture and Subsequent Risk of Burnout Among Resident Physicians Overall and by Gender. Mayo Clin Proc. 2021 Aug;96(8):2168-83.
- 33. El-Hage W, Hingray C, Lemogne C, Yrondi A, Brunault P, Bienvenu T, et al. Health professionals facing the coronavirus disease 2019 (COVID-19) pandemic: What are the mental health risks? Encephale. 2020 Jun;46:S73-80.
- 34. Escudero-Escudero AC, Segura-Fragoso A, Cantero-Garlito PA. Burnout Syndrome in Occupational Therapists in Spain: Prevalence and Risk Factors. Int J Environ Res Public Health. 2020 May 2;17(9):3164.
- 35. Feeks C, Chao J, Sinert R. Prevalence and Risk Factors for Burnout in Pediatric Emergency Medicine Fellows. Pediatr Emerg Care. 2020 May;36(5):236-9.
- 36. Filgueiras JC, Hippert MIS. A polêmica em torno do conceito de estresse. Psicol cienc prof. 1999;19(3):40-51.
- 37. Frank DI, Adkinson LF. A Developmental Perspective on Risk for Compassion Fatigue in Middle-aged Nurses Caring for Hurricane Victims in Florida. Holist Nurs Pract. 2007 Mar;21(2):55-62.
- 38. Freimann T, Merisalu E. Work-related psychosocial risk factors and mental health problems amongst nurses at a university hospital in Estonia: A cross-sectional study. Scand J Public Health. 2015 Apr 7;43(5):447-52.



- 39. Fteropoulli T, Kalavana TV, Yiallourou A, Karaiskakis M, Koliou Mazeri M, Vryonides S, et al. Beyond the physical risk: Psychosocial impact and coping in healthcare professionals during the COVID-19 pandemic. J Clin Nurs. 2021 Jul 6;0(0):1-15.
- 40. Ghio L, Patti S, Piccinini G, Modafferi C, Lusetti E, Mazzella M, et al. Anxiety, Depression and Risk of Post-Traumatic Stress Disorder in Health Workers: The Relationship with Burnout during COVID-19 Pandemic in Italy. Int J Environ Res Public Health. 2021 Sep 21;18(18):9929.
- 41. Giménez-Espert MC, Prado-Gascó V, Soto-Rubio A. Psychosocial Risks, Work Engagement, and Job Satisfaction of Nurses During COVID-19 Pandemic. Front Public Health. 2020 Nov 20:8:566896.
- 42. Gomes AR, Cruz JF, Cabanelas S. Occupational stress in health professionals: a study with portuguese nurses. Psic: Teor e Pesq. 2009;25(3):307-18.
- 43. Gómez-Urquiza J, Aneas-López A, Fuente-Solana E, Albendín-García L, Díaz-Rodríguez L, Fuente G. Prevalence, Risk Factors, and Levels of Burnout Among Oncology Nurses: A Systematic Review. Oncol Nurs Forum. 2016 May 1;43(3):E104-20.
- 44. Gómez-Urquiza JL, Albendín-García L, Velando-Soriano A, Ortega-Campos E, Ramírez-Baena L, Membrive-Jiménez MJ, et al. Burnout in Palliative Care Nurses, Prevalence and Risk Factors: A Systematic Review with Meta-Analysis. Int J Environ Res Public Health. 2020 Oct 1;17(20):7672.
- 45. Gómez-Urquiza JL, Vargas C, De la Fuente EI, Fernández-Castillo R, Cañadas-De la Fuente GA. Age as a Risk Factor for Burnout Syndrome in Nursing Professionals: A Meta-Analytic Study. Res Nurs Health. 2016 Nov 16;40(2):99-110.
- 46. Gong Y, Han T, Chen W, Dib HH, Yang G, Zhuang R, et al. Prevalence of Anxiety and Depressive Symptoms and Related Risk Factors among Physicians in China: A Cross-Sectional Study. Harper DM, editor. PLoS ONE. 2014 Jul 22;9(7):e103242.
- 47. Grochowska A, Gawron A, Bodys-Cupak I. Stress-Inducing Factors vs. the Risk of Occupational Burnout in the Work of Nurses and Paramedics. Int J Environ Res Public Health. 2022 May 3;19(9):5539.
- 48. Hegg-Deloye S, Brassard P, Prairie J, Larouche D, Jauvin N, Poirier P, et al. Prevalence of risk factors for cardiovascular disease in paramedics. Int Arch Occup Environ Health . 2015;88:973-80.
- 49. Hensel JM, Ruiz C, Finney C, Dewa CS. Meta-Analysis of Risk Factors for Secondary Traumatic Stress in Therapeutic Work With Trauma Victims. J Trauma Stress. 2015 Apr;28(2):83-91.



- 50. Heyns PM, Venter JH, Esterhuyse KG, Bam RH, Odendaal DC. Nurses Caring for Patients with Alzheimer's Disease: Their Strengths and Risk of Burnout. S Afr J Psychol. 2003 May;33(2):80-5.
- 51. Higuchi Y, Inagaki M, Koyama T, Kitamura Y, Sendo T, Fujimori M, et al. A cross-sectional study of psychological distress, burnout, and the associated risk factors in hospital pharmacists in Japan. BMC Public Health. 2016 Jul 8;16(1).
- 52. Hirschle ALT, Gondim SMG. Stress and well-being at work: a literature review. Ciência & Saúde Coletiva, 25(7):2721-2736, 2020
- 53. Hisashige A. Burnout phenomenon and its occupational risk factors among Japanese hospital nurses. J Hum Ergol. 1991 Dec 1;20(2):123-136.
- 54. Huang L, Caspari JH, Sun X, Thai J, Li Y, Chen F, et al. Risk and protective factors for burnout among physicians from standardized residency training programs in Shanghai: a cross-sectional study. BMC Health Serv Res. 2020 Oct 21;20(1):1-12.
- 55. Hurtado SLB et al. Workers' health policies in Brazil: historical contradictions and possibilities for development. Ciência & Saúde Coletiva, 27(8):3091-3102, 2022.
- 56. Iyer S, Suleman S, Qiu Y, Platt S. Risk factors for physician burnout: a perspective from Tanzania. Pan Afr Med J. 2022;41(1).
- 57. Jackson TN, Pearcy CP, Khorgami Z, Agrawal V, Taubman KE, Truitt MS. The Physician Attrition Crisis: A Cross-Sectional Survey of the Risk Factors for Reduced Job Satisfaction Among US Surgeons. World J Surg. 2017 Oct 24;42(5):1285-92.
- 58. Ji YD, Robertson FC, Patel NA, Peacock ZS, Resnick CM. Assessment of Risk Factors for Suicide Among US Health Care Professionals. JAMA Surgery. 2020 Aug 1;155(8):713-21.
- 59. Johnson J, Louch G, Dunning A, Johnson O, Grange A, Reynolds C, Hall L, O'Hara J. Burnout mediates the association between depression and patient safety perceptions: a cross-sectional study in hospital nurses. J Adv Nurs. 2017 Jul;73(7):1667-1680.
- 60. Jones S, White S, Ormrod J, Sam B, Bull F, Pieh S, et al. Work-based risk factors and quality of life in health care workers providing maternal and newborn care during the Sierra Leone Ebola epidemic: findings using the WHOQOL-BREF and HSE Management Standards Tool. BMJ Open. 2020 Nov;10(11):e032929.
- 61. Kakemam E, Raeissi P, Raoofi S, Soltani A, Sokhanvar M, Visentin DC, et al. Occupational stress and associated risk factors among nurses: a cross-sectional study. Contemp Nurse. 2019 May 4;55(2-3):237-49.



- 62. Kamau C, Medisauskaite A, Lopes B. Inductions Buffer Nurses' Job Stress, Health, and Organizational Commitment. Arch Environ Occup Health. 2014 Jun 27;70(6):305-8.
- 63. Kandelman N, Mazars T, Levy A. Risk factors for burnout among caregivers working in nursing homes. J Clin Nurs. 2017 Jul 17;27(1-2):e147-53.
- 64. Kaushik A, Ravikiran SR, Suprasanna K, Nayak MG, Baliga K, Acharya SD. Depression, Anxiety, Stress and Workplace Stressors among Nurses in Tertiary Health Care Settings. Indian J Occup Environ Med. 2021 Jan-Mar;25(1):27-32.
- 65. Khan Y, Bruyneel A, Smith P. Determinants of the risk of burnout among nurses during the first wave of the COVID-19 pandemic in Belgium: A cross-sectional study. J Nurs Manag. 2022 Apr 11;30(5):1125-1135.
- 66. Kwiatkowska-Ciotucha D, Załuska U, Kozyra C. The Perception of Occupation by Hospital Nurses in Poland and Germany in Terms of the Risk of Excessive Stress and Burnout as Well as Possible Coping and Preventive Solutions. Int J Environ Res Public Health. 2021 Feb 12;18(4):1797.
- 67. Laurent A, Fournier A, Lheureux F, Poujol AL, Deltour V, Ecarnot F, et al. Risk and protective factors for the possible development of post-traumatic stress disorder among intensive care professionals in France during the first peak of the COVID-19 epidemic. Eur J Psychotraumatol. 2022 Jan 26;13(1):2011603.
- 68. Lecca L, Campagna M, Portoghese I, Galletta M, Mucci N, Meloni M, et al. Work Related Stress, Well-Being and Cardiovascular Risk among Flight Logistic Workers: An Observational Study. Int J Environ Res Public Health. 2018 Sep 7;15(9):1952.
- 69. Lee S, Kim Y. The Influence of Risk Perception of Respiratory Infections, Infection Control Fatigue and Positive Psychological Capital on Burnout of Nurses Caring Respiratory Infection Patients. J Korean Acad Nurs Adm. 2022;28(2):154.
- 70. Lee W, Veach PM, MacFarlane IM, LeRoy BS. Who is at Risk for Compassion Fatigue? An Investigation of Genetic Counselor Demographics, Anxiety, Compassion Satisfaction, and Burnout. J Genet Couns. 2014 May 1;24(2):358-70.
- 71. Li WW, West C, Xie G. The reflective risk assessment model of professional quality of life in Chinese nurses. J Nurs Manag. 2020 Dec 17;29(4):767-75.



- 72. Li Y, Fan R, Lu Y, Li H, Liu X, Kong G, et al. Prevalence of psychological symptoms and associated risk factors among nurses in 30 provinces during the COVID-19 pandemic in China. Lancet Reg Health West Pac. 2023 Jan;30:100618.
- 73. Liang S, Zhou W, Zhao Q, Li L. Prevalence and Risk Factors of Burnout Among Chinese Pediatric Orthopedic Surgeons. J Pediatr Orthop. 2020 Aug 18;41(1):e80-4.
- 74. Liao KM, Ho CH, Lee HF, Yu CH, Wang JJ, Liang F. Risk factors of chronic urticaria among nurses with insomnia: A nationwide population-based study. Medicine. 2019 Dec;98(49):e18059.
- 75. Lin PY, Chang CC, Tung CY, Chu WH, Tong FG. Risk factors of prehypertension and hypertension among workers at public elderly welfare facilities in Taiwan: A cross-sectional survey. Medicine. 2021 Feb 26;100(8):e24885.
- 76. Lin YL, Chen CH, Chu WM, Hu SY, Liou YS, Yang YC, et al. Modifiable risk factors related to burnout levels in the medical workplace in Taiwan: cross-sectional study. BMJ Open. 2019 Nov;9(11):e032779.
- 77. Liou YF, Li SF, Ho CC, Lee MW. Risk of insomnia and hypnotics use among emergency physicians. Industrial Health. 2021;59(2):99-106.
- 78. Lozano JMG, Martínez Ramón JP, Morales Rodríguez FM. Doctors and Nurses: A Systematic Review of the Risk and Protective Factors in Workplace Violence and Burnout. Int J Environ Res Public Health. 2021 Jan 1;18(6):3280.
- 79. Maharaj S, Lees T, Lal S. Prevalence and Risk Factors of Depression, Anxiety, and Stress in a Cohort of Australian Nurses. Int J Environ Res Public Health. 2018 Dec 27;16(1):61.
- 80. McAuliffe WE, Rohman M, Wechsler H. Alcohol, Substance Use, and Other Risk-Factors of Impairment in a Sample of Physicians-In-Training. Adv Alcohol Subst Abuse. 1984 Dec;4(2):67-87.
- 81. Medisauskaite A, Kamau C. Does occupational distress raise the risk of alcohol use, bingeeating, ill health and sleep problems among medical doctors? A UK cross-sectional study. BMJ Open. 2019 May 1;9(5):e027362.
- 82. Meng H, Bai S, Cao Q. Risk factors of role stress and professional burnout among nurse anesthetists: A multicenter cross-sectional study. Japan J Nurs Sci. 2021 Mar 7;18(3):e12413, 2021.
- 83. Miguel-Puga JA, Cooper-Bribiesca D, Avelar-Garnica FJ, et al. Burnout, depersonalization, and anxiety contribute to post-traumatic stress in frontline health workers at COVID-19 patient care, a follow-up study. Brain Behav. 2021 Mar;11(3):e02007.



- 84. Molina-Praena J, Ramirez-Baena L, Gómez-Urquiza J, Cañadas G, De la Fuente E, Cañadas-De la Fuente G. Levels of Burnout and Risk Factors in Medical Area Nurses: A Meta-Analytic Study. Int J Environ Res Public Health. 2018 Dec 10;15(12):2800.
- 85. Moradi B, Barakat S. Ergonomic assessment of musculoskeletal disorders risk factors in nurses using qec method and its relation with job stress. J Knowl Health Basic Med Sci. 2021;16(1):41-50.
- 86. Munhoz OL, Arrial TS, Barlem EL, Dalmolin GL, Andolhe R, Magnago TS. Occupational stress and burnout in health professionals of perioperative units. Acta Paul Enferm. 2020; eAPE20190261.
- 87. Navarro Moya P, González Carrasco M, Villar Hoz E. Psychosocial risk and protective factors for the health and well-being of professionals working in emergency and non-emergency medical transport services, identified via questionnaires. Scand J Trauma Resusc Emerg Med. 2017 Sep 6;25(1).
- 88. Paiano M, Jaques AE, Nacamura PA, Salci MA, Radovanovic CAT, Carreira L. Mental health of healthcare professionals in China during the new coronavirus pandemic: an integrative review. Rev Bras Enferm. 2020;73(Suppl 2):e20200338.
- 89. Pedersen AF, Sørensen JK, Bruun NH, Christensen B, Vedsted P. Risky alcohol use in Danish physicians: Associated with alexithymia and burnout? Drug Alcohol Depend. 2016 Mar;160:119-26.
- 90. Pei J, Wang X, Chen H, Zhang H, Nan R, Zhang J, et al. Alexithymia, social support, depression, and burnout among emergency nurses in China: a structural equation model analysis. BMC Nursing. 2021 Oct 10;20(1):1-10.
- 91. Pélissier C, Vohito M, Fort E, Sellier B, Agard JP, Fontana L, et al. Risk factors for work-related stress and subjective hardship in health-care staff in nursing homes for the elderly: A cross-sectional study. J Occup Health. 2015 May;57(3):285-96.
- 92. Pérez-Chacón M, Chacón A, Borda-Mas M, Avargues-Navarro M. Sensory Processing Sensitivity and Compassion Satisfaction as Risk/Protective Factors from Burnout and Compassion Fatigue in Healthcare and Education Professionals. Int J Environ Res Public Health. 2021 Jan 12;18(2):611.
- 93. Pérez-Fuentes M del C, Molero Jurado M del M, Martos Martínez Á, Gázquez Linares JJ. Analysis of the Risk and Protective Roles of Work-Related and Individual Variables in Burnout Syndrome in Nurses. Sustainability. 2019 Oct 17;11(20):5745.



- 94. Pompili M, Rinaldi G, Lester D, Girardi P, Ruberto A, Tatarelli R. Hopelessness and Suicide Risk Emerge in Psychiatric Nurses Suffering From Burnout and Using Specific Defense Mechanisms. Arch Psychiatr Nurs. 2006 Jun;20(3):135-43.
- 95. Purpora C, Cooper A, Sharifi C, Lieggi M. Workplace bullying and risk of burnout in nurses: A systematic review protocol. JBI Database System Rev Implement Rep. 2019 Aug;17(12):2532-40.
- 96. Ramírez-Elvira S, Romero-Béjar JL, Suleiman-Martos N, Gómez-Urquiza JL, Monsalve-Reyes C, Cañadas-De la Fuente GA, et al. Prevalence, Risk Factors and Burnout Levels in Intensive Care Unit Nurses: A Systematic Review and Meta-Analysis. Int J Environ Res Public Health. 2021 Oct 30;18(21):11432.
- 97. Rath KS, Huffman LB, Phillips GS, Carpenter KM, Fowler JM. Burnout and associated factors among members of the Society of Gynecologic Oncology. Am J Obstet Gynecol. 2015 Dec;213(6):824.e1-9.
- 98. Richter A, Kostova P, Harth V, Wegner R. Children, care, career a cross-sectional study on the risk of burnout among German hospital physicians at different career stages. J Occup Med Toxicol. 2014 Dec;9(1).
- 99. Rogan S, Verhavert Y, Zinzen E, Rey F, Scherer A, Luijckx E. Risk factor and symptoms of burnout in physiotherapists in the canton of Bern.Arch Physiother. 2019 Dec;9(1):1-5.
- 100. Ryu E, Ye B, Yi Y, Kim J. Risk factors of musculoskeletal symptoms in university hospital nurses. Ann Occup Environ Med. 2014 Nov 4;26(1).
- 101. Saberina A, Abdolshahi A, Khaleghi S, Moradi Y, Jafarizadeh H, Sadeghi Moghaddam A, et al. Investigation of Relationship between Occupational Stress and Cardiovascular Risk Factors among Nurses.Iran J Public Health. 2020 Nov 21;49(10):1954.
- 102. Sabery M, Tafreshi MZ, Hosseini M, Mohtashami J, Ebadi A. Development and Psychometric Assessment of Risk Factors of Compassion Fatigue Inventory in Nurses. J Nurs Meas. 2019 Sep 11;27(2):E62-80.
- 103. Sakzewski L, Naser-ud-Din S. Work-related musculoskeletal disorders in Australian dentists and orthodontists: Risk assessment and prevention. Work. 2015 Aug 8;52(3):559-79.
- 104. Salem R, Akel R, Fakhri G, Tfayli A. Burnout among Lebanese Oncologists: Prevalence and Risk Factors. APJCP. 2018 Aug 24;19(8):2135-9.



- 105. Schernhammer ES, Hankinson SE, Rosner B, Kroenke CH, Willett WC, Colditz GA, et al. Job Stress and Breast Cancer Risk: The Nurses' Health Study. American Journal of Epidemiology. 2004 Dec 1;160(11):1079-86.
- 106. Scholz M, Neumann C, Ropohl A, Paulsen F, Burger PHM. Risk factors for mental disorders develop early in German students of dentistry. Annals of Anatomy. 2016 Nov;208:204-7.
- 107. Sharma P, Bansal R, Davey A, Davey S, Shukla A, Shrivastava K. Occupational stress among staff nurses: Controlling the risk to health. Indian J Occup Environ Med. 2014;18(2):52.
- 108. Shieh SH, Sung FC, Su CH, Tsai Y, Hsieh VCR. Increased low back pain risk in nurses with high workload for patient care: A questionnaire survey. Taiwan J Obstet Gynecol. 2016 Aug;55(4):525-9.
- 109. Siau CS, Wee LH, Ibrahim N, Visvalingam U, Yeap LLL, Yeoh SH, et al. Predicting burnout and psychological distress risks of hospital healthcare workers. Malaysian J Public Heal Med. 2018;1:125-36.
- 110. Silva D, Ferraz MMM, Ferreira RDSA, Lira JAC, Azevedo DDS, Amorim SMR, et al. Risco de Síndrome de Burnout em enfermeiros da saúde mental. Rev Enferm UFPE. 2019 Sep 9;13.
- 111. Silva TL, Gomes JRAA, Corgozinho MM. Level of stress in nursing professionals of a surgical center. REV. SOBECC. 2021; 26(2): 71-76.
- 112. Śliwiński Z, Starczyńska M, Kotela I, Kowalski T, Kryś-Noszczyk K, Lietz-Kijak D, et al. Life satisfaction and risk of burnout among men and women working as physiotherapists. Int J Occup Med Environ Health. 2014 Jan 1;27(3).
- 113. Smith DR, Mihashi M, Adachi Y, Koga H, Ishitake T. A detailed analysis of musculoskeletal disorder risk factors among Japanese nurses. J Safety Res. 2006 Jan;37(2):195-200.
- 114. Soto-Rubio A, Giménez-Espert M del C, Prado-Gascó V. Effect of Emotional Intelligence and Psychosocial Risks on Burnout, Job Satisfaction, and Nurses' Health during the COVID-19 Pandemic. Int J Environ Res Public Health. 2020;17(21):7998.
- 115. Steege LM, Pinekenstein BJ, Rainbow JG, Arsenault Knudsen É. Addressing Occupational Fatigue in Nurses: Current State of Fatigue Risk Management in Hospitals. JONA. 2017 Oct;47(10):484-90.
- 116. Tang L, Pang Y, He Y, Chen Z, Leng J. Burnout among early-career oncology professionals and the risk factors. Psycho-Oncology. 2018 Sep 11;27(10):2436-41.



- 117. Teixeira C, Ribeiro O, Fonseca AM, Carvalho AS. Burnout in intensive care units a consideration of the possible prevalence and frequency of new risk factors: a descriptive correlational multicentre study. BMC Anesthesiol. 2013 Oct 31;13(1).
- 118. Teixeira C, Ribeiro O, Fonseca AM, Carvalho AS. Ethical decision making in intensive care units: a burnout risk factor? Results from a multicentre study conducted with physicians and nurses. J Med Ethics. 2014;40(2):97-103.
- 119. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med. 2018 Oct 2;169(7):467-473.
- 120. Ulguim FO, Renner JDP, Pohl HH, Oliveira CF de, Bragança GCM. Trabalhadores da saúde: risco cardiovascular e estresse ocupacional. Revista Brasileira de Medicina do Trabalho. 2019;17(1):61-8.
- 121. Van Gerven E, Vander Elst T, Vandenbroeck S, Dierickx S, Euwema M, Sermeus W, et al. Increased Risk of Burnout for Physicians and Nurses Involved in a Patient Safety Incident. Medical Care. 2016 Oct 1;54(10):937-43.
- 122. Vieira I. Concept(s) on burnout current themes in research and the contribution of clinical practice. Rev. bras. Saúde ocup., São Paulo, 35 (122): 269-276, 2010.
- 123. Viotti S, Gilardi S, Guglielmetti C, Converso D. Verbal Aggression from Care Recipients as a Risk Factor among Nursing Staff: A Study on Burnout in the JD-R Model Perspective. Biomed Res Int. 2015;2015:1-17.
- 124. Visintini R, Campanini E, Fossati A, Bagnato M, Novella L, Maffei C. Psychological stress in nurses' relationships with HIV-infected patients: the risk of burnout syndrome. AIDS care. 1996 Apr 1;8(2):183-94.
- 125. Vitale E, Lupo R, Calabrò A, Cornacchia M, Conte L, Marchisio D, et al. Mapping potential risk factors in developing burnout syndrome between physicians and registered nurses suffering from an aggression in Italian Emergency departments. J Psychopathol. 2021;27:148-155.
- 126. Volpe U, Luciano M, Palumbo C, Sampogna G, Del Vecchio V, Fiorillo A. Risk of burnout among early career mental health professionals. JJ Psychiatr Ment Health Nurs. 2014 Feb 20;21(9):774-81.
- 127. Wijdenes KL, Badger TA, Sheppard KG. Assessing Compassion Fatigue Risk Among Nurses in a Large Urban Trauma Center. JONA: The J Nurs Adm. 2019 Jan;49(1):19-23.



- 128. Wild J, Smith KV, Thompson E, Béar F, Lommen MJJ, Ehlers A. A prospective study of pretrauma risk factors for post-traumatic stress disorder and depression. Psychol Med. 2016 Jun 28;46(12):2571-82.
- 129. Wu D, Gross B, Rittenhouse K, Harnish C, Mooney C, Rogers FB. A Preliminary Analysis of Compassion Fatigue in a Surgeon Population: Are Female Surgeons at Heightened Risk? Am Surg. 2017 Nov;83(11):1302-7.
- 130. Yao Y, Yao W, Wang W, Li H, Lan Y, Li W. Investigation of risk factors of psychological acceptance and burnout syndrome among nurses in China. Int J Nurs Pract. 2013;19(5):530-538.
- 131. Zhang C, Hai T, Yu L, Liu S, Li Q, Zhang X, et al. Association between occupational stress and risk of overactive bladder and other lower urinary tract symptoms: A cross-sectional study of female nurses in China. Neurourol Urodyn. 2012 Aug 17;32(3):254-60.
- 132. Zheng H, Shao H, Zhou Y. Burnout Among Chinese Adult Reconstructive Surgeons: Incidence, Risk Factors, and Relationship With Intraoperative Irritability. J Arthroplasty. 2018 Apr;33(4):1253-7.